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A NEW SUBSPECIES OF
EUPHYDRYAS EDITHA FROM THE
CHANNEL ISLANDS OF CALIFORNIA

THOMAS C. EMMEL AND JOHN F. EMMEL

Department of Zoology, University of Florida, Gainesville 32611
and 1117 9th Street, Santa Monica, California 90403

IN OUR RECENT BOOK, *The Butterflies of Southern California* (Emmel & Emmel, 1973b: p. 34), we mentioned the occurrence of an unrecognized dark race of *Euphydryas editha* (Boisduval) on the Channel Islands off the coast of Santa Barbara and Ventura Counties, California. The purpose of this present paper is to formally describe this new subspecies. Publications already out (e.g., Emmel, 1967; Singer, 1971, 1972) and in preparation analyze the ecological, host plant, and evolutionary affinities of the various geographic sets of populations of *Euphydryas editha* in California and the other western states. These data will allow evolutionarily interesting comparisons to be made with information from similar studies in the *Euphydryas chalcedona* complex (Hovanitz, 1941, 1942; LeGare & Hovanitz, 1951; Emmel & Emmel, 1973a; Emmel, T. C., in preparation).

Euphydryas editha insularis, new subspecies
(Figure 1: a, b, and c)

Diagnosis: This is a very dusky, *blackish* subspecies with melanic scaling greatly reducing the moderate to extensive yellow and red spotting present on other coastal and montane *Euphydryas editha* subspecies in California. The type series specimens of five males and one female are slightly larger by one to three millimeters of forewing length than the average *E. e. bayensis* specimen from coastal central California (Emmel, 1967: p. 75-76). The two sexes are remarkably similar in wing coloration and pattern.

The forewings above have a faint, nearly marginal row of dull red spots and a faint submarginal row of small crescent-shaped cream spots. A wide black submarginal band bears a row of small



Fig. 1. — *Euphydryas editha* specimens from the Channel Islands and coastal California populations. Top row: (a) *Euphydryas editha insularis*, Emmel & Emmel, holotype male of new subspecies, Santa Rosa Island; (b) *E. e. insularis*, allotype female, same locality; (c) *E. e. insularis*, paratype male, ventral surface, same locality. Bottom row: (d) *E. e. insularis*, *bayensis* Sternitzky, male, from population nr. Hwy. 198, 19 mi. E by S. from King City, Monterey Co., California, 17 April 1964, T. C. Emmel, leg.

cream spots. A nearly continuous row of cream-red spots follows in a median position, with one or two red spots alternating with cream spots extending posteriorly from the coastal margin of the forewing as one progresses basally from the median row. One cream spot is found posteriorly in the otherwise-black basal half of the wing.

The hindwings above exhibit five well-isolated rows of red and cream spots, alternately placed distally to proximally in a rich black ground color. There is a faint, nearly marginal row of small, dull red spots, and a submarginal row of slightly larger cream spots. There is a postmedian row of crisply-bordered, entirely dull red spots, of small size compared to mainland coastal populations (see Fig. 1). There is a median row of distinct cream spots (the spots in this row merge and become an essentially continuous band in *E. e. bayensis*, separated only by black-pigmented veins). Basal to this is a very faintly marked row of reddish spots, with the bottom half usually heavily melanic. Proximal to the body are several irregularly-shaped cream spots.

Ventrally, the forewing and hindwing patterns are strongly marked with red and cream with reduction of melanic portions to along wing veins *except* in the submarginal black band area on the forewing and in the postmedian area to the outside of the median row of cream spots on the hindwing. Only in these two areas do the underside pattern and coloration diverge notably from those of mainland populations by being blackish in aspect.

The subspecies is named for the type locality, the Channel Islands group off the coast of California. The type specimens were collected by Chris Henne in 1941 on Santa Rosa Island (one fresh female on March 31, and five fresh males on April 1). Henne (personal communication) describes the exact locality of the colony as being at the top of a rolling hill at perhaps 300 feet elevation, directly behind the ranch house on the Vails' Ranch. Poor weather prevailed during his visit (made with Lloyd Martin of the L.A.C.M.). One very worn *E. chalconota* male was taken on Santa Cruz Island, March 27, 1941, by Lloyd M. Martin; the specimen is labeled with the L.A.C.M. Channel Islands Biological Survey label (No. 1941-4707), and was placed in the Museum Collection with the series of six *E. editha* from Santa Rosa Island. However, it is clearly *chalconota*.

HOLOTYPE Male: Radius of forewing, 22.1 mm.; CALIFORNIA, Santa Barbara County, Santa Rosa Island, April 1, 1941. Collected by C. Henne. Los Angeles Museum Channel Islands Biological Survey. No. 1941-4831.

ALLOTYPE Female: Radius of forewing, 28.5 mm.; CALIFORNIA, Santa Barbara County, Santa Rosa Island, March 31,

1941. Collected by C. Henne. Los Angeles Museum Channel Islands Biological Survey. No. 1941-4755.

PARATYPES: 4 males, same locality, collector and survey number data as holotype.

The holotype, allotype, and paratypes are deposited in the collection of the Natural History Museum of Los Angeles County.

It is worthy of note that despite extensive correspondence with many California lepidopterists during the preparation of our book, no additional records or specimens of *Euphydryas* from the Channel Islands have come to light. The above seven butterflies were taken during the Los Angeles County Museum's Channel Islands Biological Survey (1941). Robert Langston of the University of California Medical Center at San Francisco has done subsequent field work on Santa Cruz Island and did not find *E. editha* in April; however, *Euphydryas chalcedona* (Doubleday) was found during a visit to this island by Langston from April 25 to May 1, 1966. None of the many lepidopterists who have collected on Santa Catalina Island in all months throughout the years has found *E. editha*. For that matter, *E. chalcedona* itself surprisingly has not been recorded from Santa Catalina Island (Meadows, 1936; Emmel & Emmel, 1973b).

A glance at the map of the relative positions of the Channel Islands in Figure 2 shows that the northern cluster of the four islands of Anacapa, Santa Cruz, Santa Rosa, and San Miguel is more susceptible to colonization from the few known coastal *E. editha* colonies (Emmel & Emmel, 1973) on the mainland, than are the relatively well isolated southern islands of Santa Catalina, San Clemente, San Nicholas, and Santa Barbara, particularly by a non-migratory and indeed relatively sedentary species (Ehrlich, 1965; Singer, 1972).

Historically, there is even stronger reason to see why *E. editha* would be found in the northern and not the southern Channel Islands. Thorne (1969) states that the northern group had terrestrial connection with the mainland down to perhaps a half million years ago, and that all these islands were interconnected with each other (but not with the mainland) during the Iowan or lower Wisconsin glacial stages from about 11,000 to 20,000 years ago, when sea levels were lower. There seems to be no evidence for the possibility of recent overland migration to the southern Channel Islands, due to their prolonged and complete submergence during the Pliocene and Pleistocene epochs (Thorne, 1969).

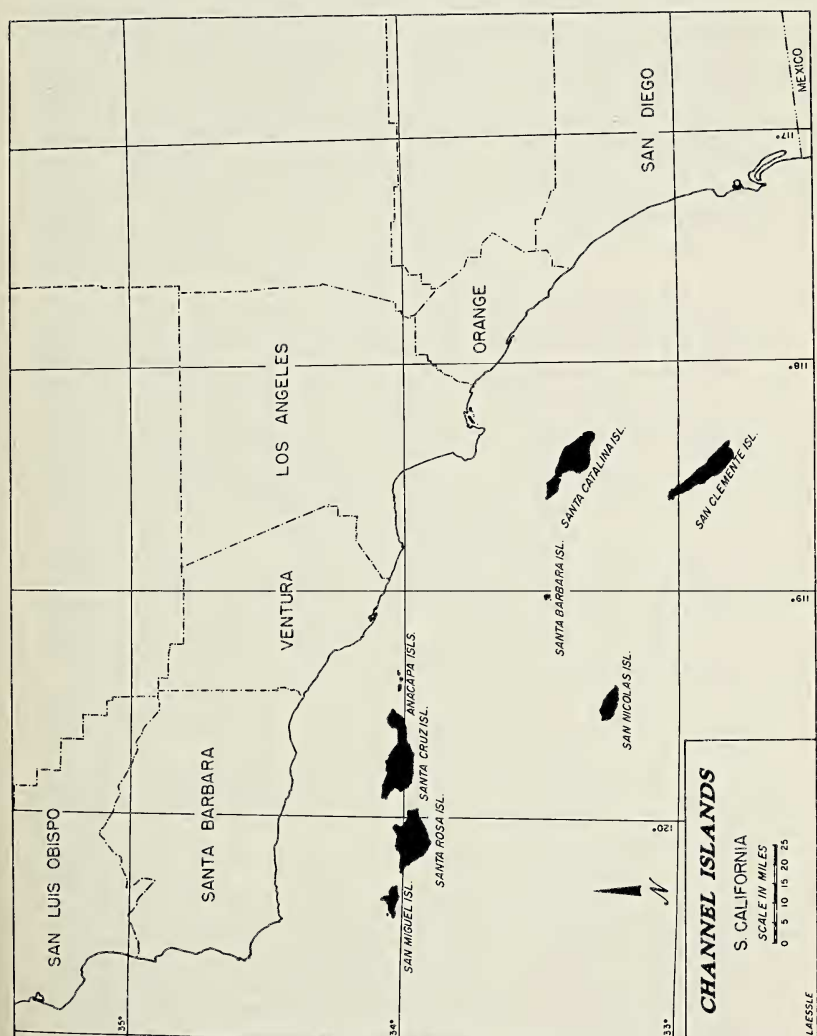


Fig. 2. — Map of the Channel Islands and the coastal counties of southern California.

One man-influenced factor contributing to the few records of butterflies from the northern Channel Islands in the past has been their private or Navy ownership and relatively restrictive policies on visitation. The establishment of several university laboratories on the isthmus of Santa Catalina and on Santa Cruz Islands, as well as Channel Islands National Monument on Santa Barbara, San Miguel, and Anacapa Islands, has made these sites easier to visit. Details of how to secure permission to visit these areas and the other islands are given by Thorne (1969: pp. 406-407). It is also worth noting that the native vegetation of several islands has been devastated by feral animals such as goats, and these islands may presently have no suitable habitats for *Euphydryas* colonies.

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